

Dust collector operators typically utilize on-demand cleaning systems to help them ensure effective dust control for their process areas while conserving compressed air. Troubleshooting a dust collector cleaning system can be challenging to diagnose, especially when the cleaning system includes an on-demand controller. The following maintenance tips will allow you to more easily troubleshoot the cleaning controls.

KNOW THE COMPONENTS

- **On-Demand Controller** – These devices typically contain a pressure sensor for monitoring static differential across the filters, an operator display, and an electrical control component that monitors sensor readings and sends signals to a timer board.

A Photohelic gauge is a common on-demand controller, but digital options now exist, offering similar performance with additional benefits (Figure 1). These devices all typically have variable set points for high static and low static conditions, where a signal is sent to the timer board pressure switch that initiates or discontinues the sequence of solenoid energizing. Each time the timer energizes a solenoid, air pressure triggers the diaphragm valves to discharge a burst of compressed air into the filters to dislodge dust particles that may have accumulated on the media surface.

More advanced controllers will also include a high static alarm point that can then output a signal to allow an operation's system to note a high pressure drop condition for a collector. Other controllers can provide alarms when continued pulsing of the collector fails to reduce the pressure drop across the filters.

- **Timer Board** – the device that controls the sequence of energizing solenoid valves.
- **Packaged On-Demand System** – this integrates an on-demand controller and timer board into one complete package (Figure 2).

NORMAL USE AND OPERATION

During normal use and operation, on-demand controllers monitor the differential pressure across the filters in the collector. The dust collector

operator receives a visual indication of the pressure drop across the filters, indicating how clean or dirty the filters may be. Typically, the lower the indicator value for pressure drop, the cleaner the filters, and the higher the value, the dirtier the filters. Dirty filters tend to provide better filtration efficiency with their cake of accumulated dust, but they require additional energy from the fan in order to maintain airflow volume.



FIGURE 1



FIGURE 2

The primary benefit of on-demand controllers is their ability to program high set points (when a filter cleaning system starts energizing solenoids) and a low set point (when the cleaning system stops energizing solenoids). By programming the high and low set points effectively, the on-demand controller triggers filter cleaning only within the desired range, stopping compressed air consumption when filters are at a reasonable pressure drop.

Normally, a dust collector will take in the process contaminant and air with some of the contaminant collected being deposited on the surface of the filter media. As this layer of dust on the filter surface becomes thicker and denser, the pressure sensor of the controller will gradually increase, eventually reaching the high set point and triggering the cleaning system to initiate sequential energizing of the cleaning system solenoid valves. As the filters are

cleaned, the pressure drop across the filters slowly decreases until it eventually falls below the low set point on the controller at which point the system will stop energizing solenoids.

TROUBLESHOOTING ISSUES

If an operator notes the on-demand indicator has exceeded the high set point but the pulse jet cleaning system is not cleaning, walk through the following diagnostics:

1. First check the simple items:
 - a. Make sure the compressed air is turned on.
 - b. Ensure there is compressed air at the dust collector compressed air manifold.
2. If compressed air is present, check for simple electrical problems by ensuring both the on-demand controller and timer board are powered. An LED indicator light should be illuminated on the timer board (Figure 3).



FIGURE 3

3. If Steps 1 and 2 check out, then check to see if the timer board is running through a sequence of energizing the solenoid valves by observing the LED output indicators which illuminate sequentially as the solenoid valves are energized.

4. If the timer board is **not** energizing the solenoid valves in sequence, you need to have a qualified electrician help determine if the fault is in the timer board or the on-demand controller.
 - a. To troubleshoot, have a qualified electrician isolate the two devices. With the power turned off, have the electrician remove the two wires coming from the on-demand controller to the timer board pressure switch location.
 - b. Next, with the power still off, have the electrician install a jumper wire across the timer board pressure switch terminal.
 - c. After restoring power, evaluate the results.
 - i. If the timer board begins to energize solenoids in sequence (Figure 4), the on-demand controller is the faulty component and it should be replaced.
 - ii. If the timer board does not begin energizing solenoids in sequence, the timer board is the faulty component and it should be replaced.



FIGURE 4

Armed with the ability to ensure the continued effectiveness of your dust collector's on-demand cleaning system, you're now set to keep reaping its benefits!

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